January 1988 Volume 8, Number 10

Soil and Water Conservation News

United States Department of Agriculture
Soil Conservation Service

Conservation Around the World

Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget. *Soil and Water Conservation News* (ISSN–0199–9060) is published 12 times a year. Postage paid at Washington, D.C.

Magazine inquiries
Send inquiries to: The Editor, *Soil and Water Conservation News*, Public Information Division, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, D.C. 20013–2890.

Subscriptions
Send subscription orders to:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Comments:
From the SCS Chief

Helping to Protect Soil and Water Around the World

"Give a man a fish, and you have fed him for a day. Teach him how to fish, and you have fed him for life." This old proverb explains the idea behind the work of the Soil Conservation Service in helping people here at home and around the world to protect and improve their natural resources while using them to produce food and fiber.

It is important for people to feel the sense of accomplishment that comes from being able to produce enough food to support themselves and their families.

Ethiopia and other countries are suffering from another drought and accompanying food shortages. A long-term solution for these countries is to establish a stable agriculture, and the first step is proper use and protection of natural resources.

Just recently, Clarence Durban, president of the National Association of Conservation Districts, participated in dedicating the first soil and water conservation district in The Gambia, West Africa.

Some people may question the U.S. Government's policy to improve food and fiber production in developing countries. But, through our aiding their economic growth and stability through agriculture, developing countries ultimately become a market for U.S. agricultural products.

According to a USDA study, a 10 percent increase in per capita income in developing coutries led to a 13.6 percent rise in American exports to those countries. Within the past few years, developing countries have replaced developed countries as America's fastest growing markets.

SCS specialists share their expertise in testing, mapping, and managing soils with countries who request their assistance and exchange scientific and technical information on resource management with many others.

In 1987, SCS sent 185 employees to 35 different countries to provide soil and water conservation assistance, attend international meetings, and participate in scientific and technical exchanges. Additionally, SCS received 203 visitors from 60 other countries. During the year, I visited SCS employees on long-term assignments in Mexico and Indonesia. I was pleased with our employees' dedication and accomplishments.

SCS provides assistance to other countries through reimbursable agreements administered by the U.S. Department of Agriculture's (USDA) Office of International Cooperation and Development (OICD). OICD also coordinates participation in scientific and technical exchanges with other countries.

Among the benefits to SCS from its international conservation program are gains in technical knowledge and professional development. This includes the benefit of technology exchanges to the SCS plant materials program. More than a third of SCS conservation plant releases originated in other countries.

In addition to exchanges of soil and water technology, our people are helping to carry out United States' foreign policy to promote economic stability, reduce poverty, and solve world food problems.

Whether I am talking about soil and water conservation with people abroad, or just across the fence from me at home, I consider them all part of one big conservation family.

Cover: View of Earth as photographed from the Apollo 17 spacecraft during the final lunar landing mission in the Apollo program of the National Aeronautics and Space Administration (NASA). Almost the entire coastline of the continent of Africa can be seen. (Photograph provided by NASA.)

Richard E. Lyng
Secretary of Agriculture

Wilson Scaling, Chief
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Editor, Nancy M. Garlitz

Associate Editor, Paul D. Barker

Editorial Assistant, Ann P. Serota

Design Consultant, Christopher Lozos

SCS Fosters Worldwide Soil and Water Conservation

Soil Conservation Service technical specialists share their expertise with people from developing and developed nations in many ways. One way is by providing formal and informal training in soil and water conservation in the United States.

Since 1980, SCS has helped to train more than 1,750 visitors from over 100 different countries in soil and water conservation, natural resource surveys, and community resource protection and development. These visitors have included students, scientists, technicians, farmers, and agricultural administrators.

Many of the foreign students that SCS has worked with have been identified by their governments as having the potential to become agricultural leaders in their own countries. These students enroll in U.S. colleges and universities for undergraduate and graduate studies in soil and water conservation and related subjects. During summer breaks, or after they have completed their academic training, SCS arranges for foreign students to gain on-the-job training. The students observe and participate in planning, designing, and establishing soil and water conservation practices. Many return to specialist-type positions in their home country.

Scientists and technicians come to the United States to strengthen their professional and technical skills in soil and water conservation and to learn new skills. Some are more experienced than others, and SCS tailors the training to meet the needs of individuals and their governments. Training typically is a combination of field work and office assignments running from one day to several months, depending on what visitors want to study and to what extent.

Scientists and technicians from other countries observe SCS personnel as they work directly with individual farmers, local leaders, and organizations, such as soil and water conservation districts. They also observe how local, State, and Federal agencies work together for a common goal. The SCS specialists who work with these foreign scientists and technicians gain professionally and personally from the experience as well.

Farmers who visit from other countries tour farms and ranches that demonstrate sound soil and water conservation practices and systems. Typically, visiting farmers are influential in their local areas and could do much to initiate and support conservation programs back home.

Foreign agricultural administrators are given the opportunity to consult with high level U.S. officials. Generally, visiting administrators are interested in the overall operation of SCS and are interested in learning techniques they can adapt in their own country. Many times, these officials spend some time at SCS National Headquarters, State, area, and district offices to observe operations at each level.

SCS does not receive Federal funding to conduct its international training program. Some training is conducted on a reimbursable basis by sponsors, which include the U.S. Agency for International Development, the Food and Agriculture Organization of the United Nations, international development organizations, and foreign governments.

The SCS technical specialists who are selected to conduct training for international visitors are encouraged to provide opportunities for them to meet American families and visit their homes and community organizations to help them gain a better understanding of United States' customs and people.

The goals of SCS in sharing its expertise in soil and water conservation with people from other countries are to help them better contribute to the development and maintenance of their agricultural resources and to build bridges of cooperation between nations and friendship between people.

Gail C. Roane,
program management specialist, International Conservation Division, SCS, Washington, D.C.

SCS Radar Detects Past

With the aid of ground-penetrating radar (GPR) provided by the Soil Conservation Service, an archeological team in Israel recently located an underground water cistern believed to be more than 2,500 years old.

GPR works by sending electromagnetic waves into the ground that are reflected back by subsurface features to create a graphic picture of what lies below. SCS, a leader in the application of GPR, uses GPR to a limited extent to locate bedrock, voids, and sinkholes in surveying soils. Such information is invaluable in planning the construction of dams, roads, and other structures.

With SCS assistance, a team of U.S. archeologists, remote sensing specialists, and other scientists spent 3 weeks this past July conducting a GPR subsurface survey at Tell Halif, near Beersheba in southeast Israel. A "tell" is a mound of earthen materials formed by the successive building of one settlement over the ruins of another. Tell Halif has been continuously occupied since before 3000 B.C.

During each summer since 1976, a staff of about 30 specialists and 40 students and volunteers has been carefully and slowly excavating one level at a time at Tell Halif as part of the Lahav Research Project. "Unfortunately," noted Joe Seger, director of the project, "digs are becoming increasingly costly to conduct and are time consuming and destructive."

Seger turned to GPR as an economical, nondestructive way to rapidly assess large areas of Tell Halif for potential archeological finds. In a cooperative agreement with Mississippi State University (MSU) and the Cobb Institute of Archaeology, the Office of International Cooperation and Development of the U.S. Department of Agriculture arranged for SCS to provide GPR field assistance to the project. Through this agreement, SCS provided the archeologists an advanced technological tool that would normally have been unavailable to them. In return, SCS was able to further refine its expertise in the use of GPR, since excavations at archeological sites provide an opportunity to immediately verify GPR interpretations.

Once the GPR equipment was on-site in Israel, the tell was divided into grids and the radar was pulled over each area, row by row. After several preliminary traverses on the tell's summit in an open area presumed to be devoid of artifacts, the GPR indicated the presence of a peculiarly shaped, large object beneath about 24 inches of soil. The site was excavated and a boulder exposed. Debris began disappearing beneath the rock. Further investigation revealed that the boulder was covering a 12-foot vertical entry shaft to a water cistern.

The underlying cistern is a 30- by 15- by 11-foot rectangular chamber cut into limestone bedrock. Excluding the ceiling, the whole cistern was sealed by several layers of plaster. A shallow deposit of waterborne silt covers the cistern's floor. Artifacts recovered from the cistern are primarily from the Iron Age (ca. 800 B.C.). In the words of Seger, finding the buried cistern "provided a dramatic demonstration of the GPR's capabilities."

Additional GPR traverses made inside and around the cistern suggest the presence of adjacent cisterns. As a result of these and other traverses, two new study areas were established and several sites were expanded. Field workers excavated eight of the many subsurface "anomalies" identified by the GPR and, at each point, found wall foundations or artifacts at the depths and locations indicated by the radar.

SCS often cooperates with other agencies and organizations to survey, document, and protect archeological resources. It has provided GPR assistance at several archeological sites in the United States to locate buried artifacts, facilitate excavation planning, and aid site interpretations. The GPR is proving to be an effective tool that can help archeologists learn a great deal about the daily lives and resource problems of ancient people in a short amount of time and with minimal damage to the cultural resources.

James A. Doolittle,
soil specialist (GPR), SCS, Northeast National Technical Center, Chester, Pa.

James A. Doolittle, SCS soil scientist, in foreground, and Frank Miller, remote sensing specialist from Mississippi State University, survey the summit of Tell Halif, Israel, with ground-penetrating radar.

Photo by Patricia O'Connor-Seger, Lahav Research Project, Cobb Institute of Archaeology, Mississippi State, Miss.

Windbreaks In China

In China, windbreaks are used to control soil movement, improve the environment, and increase crop yields. The hot dry wind that comes in May to the north China plains can reduce crop yields by 30 percent. Windbreaks temper its effect, an important benefit in a country whose population of 1 billion is growing steadily.

Besides increasing crop yields, the Chinese are using windbreaks for other economic uses. Windbreaks are designed to be harvested in 10 to 20 years for lumber and other wood products. Pruned branches are used for fuel, livestock feed, and basket weaving.

In April 1987, a U.S. Windbreak Technology Team of U.S. Department of Agriculture Soil Conservation Service and Forest Service personnel traveled to China to learn more about its windbreak program. Similar to the United States, the Chinese first planted wide windbreaks to control wind erosion. In the past 10 to 15 years, however, they have accelerated planting and gone to narrower designs.

The U.S. team began its tour in Beijing with a briefing by the staff at the Research Institute of Forestry of the Chinese Academy of Forestry and travelled southward across the northern plains in Shandong, Anhui, Henan, and Hubei Provinces.

China's integrated windbreak system has developed from extensive research on windbreak design and its effect on crop yields. Wind intensity, rainfall, and soil determine the best design for an area. The area is planted in windbreaks over a 1- to 3-year period.

The basic design is a network of windbreaks on all four sides of the fields. Main, or principle, windbreaks, generally three to five rows deep, run along both sides of roads and canals. Secondary windbreaks, usually one row, run perpendicular to principle windbreaks.

On irrigated land, trees and grain are being intercropped. Intercropping is similar to the single row windbreaks used in the United States. The main difference is that the trees are also being raised as a crop.

The U.S. team visited two sandy areas in Shandong and Henan Provinces where farmers were intercropping winter wheat/corn and jujube, or Chinese date trees. Wheat yields have increased by 25 to 30 percent, and the dates provide extra income. The recommended spacing for maximum wheat yields is 100 feet between rows, but since the income from the jujube is higher than the wheat, row spacings as narrow as 20 feet are being tried. A 3-foot isolation strip is left between the wheat and trees.

All of China's crop production areas protected by windbreaks are being double cropped. Usually winter wheat is planted in the fall and harvested in early June. This is followed by a variety of crops including soybeans, cotton, tobacco, and corn. The second crop is planted 3 to 4 weeks before the winter wheat is harvested. All of the planting and harvesting of crops is done by hand.

In addition to crop protection, windbreaks are being used in reclaiming unproductive land. In one alkaline soil area in Shandong Province, a four-step approach to land reclamation is being used. The process includes digging wells for irrigation to leach the salts and lower the water table, constructing canals to carry away leached salts and prevent flooding, applying phosphorous fertilizer and green manure to improve soil structure, and planting windbreaks of primarily poplar, elm, willow, and black locust to reduce evaporation. This process has been successful in the 20,000-acre test site the U.S. team visited where crop yields of wheat and cotton, as well as income, have increased by 10 times.

In Hubei Province, poplar, Dawn redwood, and willow trees in 5- to 10-row plantings protect canals, rivers, and dikes from wave erosion. Where willow is used, the trees are topped at the high water level so new branching can dissipate the force of the water.

China's windbreak system is controlling soil movement, improving the environment, and increasing crop yields. Today, 7 percent of the land area is planted in windbreaks, and the Chinese government has set a goal of planting 10 percent in windbreaks by the year 2000.

Sheridan Dronen,
forester, SCS, Huron, S. Dak.

Bruce Wight,
forester, SCS, Bismarck, N. Dak.

A forestry engineer for the Dezhou region in Shandong Province explains the different designs being used for windbreak harvest and regeneration to members of a U.S. delegation that included SCS employees.

Indonesia to Map Soils, Protect Resources

Indonesians are determined not only to grow their own food, but also to conduct their own soil surveys and manage their own resources.

Since Indonesia gained its independence 40 years ago, emphasis of the country's agriculture has gradually shifted from estate export crops such as coffee, tea, and rubber to food crops. This shift has changed Indonesia from serious dependency on imported rice to self-sufficiency in rice production.

As the population has grown, crop production has expanded from the rice-producing lowlands to the steep, rain-fed (nonirrigated) lower mountain slopes where food crops other than rice are grown. But on this steep land, erosion is very high, yields are low, and the need for advanced agricultural technology is great. These upland areas are the target of the U.S. Agency for International Development's (USAID) Upland Agriculture and Conservation Project (UACP) in Indonesia.

The Soil Conservation Service of the U.S. Department of Agriculture has provided technical assistance to the UACP since 1985. In the early phases of the project, SCS soil conservationists identified a critical need for soil survey data. They could see that desirable practices, such as check dams, were succeeding in some areas but failing in others where the only differences were in soil properties. It was clear that the Indonesian farmers needed adequate soil survey data to successfully farm the lower mountain slopes. Soil survey data would help them select suitable crops and plan and apply effective conservation practices.

For one progressive Indonesian, M. Sudjadi, the need for soil survey data represented an opportunity. As head of Indonesia's Centre for Soil Research (CSR), Sudjadi was always looking for ways his organization could contribute to the economic and social well-being of Indonesia. He reasoned that the CSR, with its long-standing mission of soil research, could learn, through a technology exchange with the United States, how to conduct the needed soil surveys. In return, the United States could gain tropical crop technology and refinements of the soil taxonomy system and other advancements in soil science.

Following studies and evaluations, UACP approved a soil survey project for which CSR is responsible. Sudjadi assigned most of the CSR staff to survey teams in Central Java and East Java.

An intensive training program was begun, starting with internal training by senior CSR staff. In early 1987, SCS staff helped to conduct short, intensive training

By conducting a modern soil survey of their upland soils, Indonesians are acquiring the soils information necessary to plan and apply conservation practices. If properly applied, practices such as the bench terraces at left in the Salatiga Area Demonstration Plot in Central Java, where the soils are typical of the area being surveyed, can help farmers grow crops and protect the soil from erosion. The experience gained in surveying the upland soils should then help in surveying and managing the soils in other areas of intensive land use, such as the rice paddy above, near Ciawa, that is being prepared for planting.

sessions in soil survey methods. In such training efforts, language barriers can cause major problems, but because many of the CSR staff have a high proficiency in English, the American instructors were able to lecture in their native English. Some critical material was also translated into Bahasa Indonesia by key CSR staff. Instruction included hands-on soil survey exercises in the field.

The soil survey group numbers approximately 30 people. About two-thirds are from CSR, and the others are from other Indonesian agencies. Matt Cauley, an American soil scientist, was contracted by USAID to assist the CSR staff in day-to-day field activities. The surveyors work a 3-week schedule (8 to 12 hours per day, 7 days per week) in field mapping operations and then return to their families in Bogor (West Java) for a few days near the end of each month. The group is also involved in other aspects of modern soil surveying such as pedon description and sampling, monolith preparation, laboratory characterization, development of soil series concepts, and development of standards for soil interpretations for different crops. Soil correlation assistance is scheduled to begin near the end of the field survey work.

When the soil survey is complete, a cadre of Indonesian specialists will be trained to assist farmers and planners in applying the data. Ultimately, much of the success of the UACP and of Indonesia's long-term food production effort will depend on how well the soil survey data are interpreted to guide individual farmers in the conservation of Indonesia's soil and water resources.

Lawson D. Spivey, Jr.,
soil scientist, Soil Survey Division, SCS, Washington, D.C.

Survey Shines In The Gambia

Even if it means mounting soil monoliths with floor polish, soil scientists in The Gambia are determined to conduct a soil survey program that shines.

The Gambia covers an area on the western tip of Africa that is about the size of Connecticut. It extends from the Atlantic Ocean for about 200 miles inland along both sides of the Gambia River. Since 1979, the Soil Conservation Service of the U.S. Department of Agriculture (USDA) has been helping The Gambia to establish a permanent agency to combat soil erosion and water pollution and to serve as a model for other African nations. The assistance is provided by SCS personnel assigned through the U.S. Agency for International Development and USDA's Office of International Cooperation and Development.

In many ways, the country's Soil and Water Management Unit (SWMU), which is an agency of the Ministry of Agriculture and Natural Resources, is similar to SCS. It has a Soil Survey Section to provide soil survey data to the Planning Section of SWMU for use in planning and installing conservation practices and water management practices. The Soil Survey Section also provides soil data to other agencies involved in research, agricultural diversification, and natural resource management.

Salt water from the Gambia River and its tributaries has intruded onto and damaged many low areas that have been used for rice. The Planning Section uses soil survey data to help locate and avoid these salt-damaged areas and to locate sites for dikes that will block further intrusion of the salt water.

The Soil Survey Section consists of five employees—two soil scientists and three agricultural assistants. The two soil scientists have received part of their education and training in the United States. In the field, these employees map, sample, and describe the different soils much the way soil scientists do in the United States. Their goal is to survey the entire country within the next 10 years.

An activity that is often performed in conjunction with soil surveys is the extracting and mounting of soil monoliths. A soil monolith is a thin vertical slice of a soil that is useful in displaying the soil's profile for informational and educational purposes. This past year when the Soil Survey Section undertook this task, it discovered that the recommended tools were not available in The Gambia. To improvise, a tray for extracting the monoliths was designed from sheet metal obtained locally. In place of the clear plastic solution normally used to hold the soil particles to the board, acrylic floor polish was obtained from the American Commissary. With these tools, the employees extracted and mounted monoliths representing three different soil series. The monoliths are proving very useful, and the section plans to continue until all major soil series of The Gambia are represented.

Horace Smith,
State soil scientist, SCS, Raleigh, N.C.

SCS Begins New Exchange with East Europe

Soil Conservation Service conservationists are breaking new ground through scientific and technological exchanges with East European conservationists in Bulgaria, Hungary, and Romania. Few such exchanges with these countries have occurred before.

East Europe has been involved in intensive agriculture since pre-Roman times. In a 1985 exchange with Romania, SCS Conservation Agronomist Arnold King and Agricultural Engineer Walter Twitty from the South National Technical Center in Fort Worth, Tex., looked at the long-term effects of water erosion on farmland in Romania.

Romania has soil and climate conditions similar to the Pacific Northwest area of the United States, where soil erosion is a major problem. Romanians are using many of the same practices to control soil erosion as U.S. farmers, such as contour farming, stripcropping, and buffer strips, and Romania is in the early stages of conservation tillage research. The visiting SCS specialists made recommendations for improving the efficiency of some of the conservation practices and shared what SCS has learned about testing conservation tillage systems.

In 1985 and 1986, the Poushkarov Institute of Soil Science and Yield Programming near Sofia, Bulgaria, welcomed SCS soil scientists to review the institute's automated agricultural data base. The data base is used in planning soil management for individual farm fields, planning plant density, making fertilizer recommendations, and estimating crop yields. Bulgaria is one of the first countries in the world to have a country-wide soil map.

In the summer of 1986, three SCS specialists presented papers at a joint round table discussion on soil conservation technologies in Budapest, Hungary.

In an effort sponsored by the U.S. Department of Agriculture (USDA) and the U.S. Geological Survey of the Department of the Interior, scientists from the Hungarian Ministry of Agriculture and Food are working with their U.S. counterparts on mapping the level of radioactivity in soils. For the United States, such a map could serve as a reference point from which to measure increases in soil radioactivity.

In October 1987, Edgar Nelson, SCS associate deputy chief for technology in Washington, D.C., participated in the fifth session of the Joint U.S.-Hungarian Working Group on Agriculture in Budapest. The annual meeting provides overall guidance for the exchanges. The administrator of USDA's Office of International Cooperation and Development (OICD), Joan Wallace, and the director-general of the Hungarian Ministry of Agriculture and Food, Geza Zala, co-chaired the meeting.

OICD coordinates USDA's participation in scientific and technological exchanges with other countries. The goal of these exchanges is to broaden the capacity of the agricultural community to respond to changing economic and ecological patterns around the world. Several more scientific and technological exchanges with these East European countries are scheduled through 1989.

John McAlpine,
East Europe program officer, Office of International Cooperation and Development, U.S. Department of Agriculture, Washington, D.C.

Jerry Hammond,
director, International Conservation Division, SCS, Washington, D.C.

Cooperating for Clean Water

Missisquoi Bay is one of the northernmost embayments in Lake Champlain. It is also one of the most polluted. And, since the bay straddles the border between Vermont and the Canadian Province of Quebec, cleaning it up is an exercise in international cooperation.

Two major stream systems—the Pike and Rock Rivers—join with the Missisquoi River and flow into the bay. Runoff of plant nutrients and organic matter from farmland on both sides of the border enters these streams. In the water of the bay, these materials have increased plant growth and other organic activities that use up the oxygen that fish and other animals require. As a result, the recreational value of the bay has declined.

On the American side, the Missisquoi River Watershed is targeted by the State of Vermont's comprehensive plan to improve water quality in Lake Champlain. In 1979, the Soil Conservation Service of

Great Effort For Great Lakes

The concern for water quality may not be as old as mud, but it has been around for a while. The effort to protect and preserve the Great Lakes, for example, goes back at least to 1912 when the International Joint Commission identified the quality of the water in the lakes as a problem.

The International Joint Commission was formed by the Boundary Waters Treaty of 1909 between the United States and Canada. (The boundary between the two countries runs through four of the five Great Lakes. Only Lake Michigan is wholly within the United States.) In 1919, the commission recommended a new treaty to control pollution in the Great Lakes.

New studies in the 1940's led to further commission recommendations for water quality objectives and for the monitoring and surveillance of water quality. In 1964,

the U.S. Department of Agriculture began helping the State develop a plan for managing the watershed under the Watershed Protection and Flood Prevention Act, Public Law 566.

At the same time, the Provincial Government of Quebec—the Canadian equivalent to a U.S. State government—was doing an extensive inventory of agricultural practices in the Canadian part of the watershed. Quebec's Ministry of the Environment calculated that about a third of the phosphorus load to the watershed was from point sources, 3 percent coming from Canada and 26 percent from the United States. The rest was from nonpoint agricultural sources, 31 percent from Canada and 40 percent from the United States.

While it was clear that both countries wanted clean water, it was also clear that there are serious differences within the watershed that affect the way this goal can be achieved. Most of the American farmers keep dairy cows, grow corn, and speak English. Most of the Canadian farmers keep swine, grow cereal grains in addition to corn, and speak French. In view of these differences, officials on both sides of the border concluded that reducing the nonpoint-source pollution entering Missisquoi Bay would require cooperation between countries and the sharing of data. In the summer of 1984, contacts were established between SCS and the Ministry of the Environment to coordinate the tracking of nonpoint-source treatment efforts for the bay.

This project has led to additional cooperation, and may lead to more. In February 1986, at the request of the Canadian Government, SCS State Conservationist John Titchner met with Canada's Resource Working Group on Resource Sustainability and Enhancement. The task of this group was to document program efforts by individual provinces and recommend National and Provincial Policies for an integrated Soil and Water Conservation Program. This meeting helped support the ongoing working relationship that SCS has established with the Province of Quebec and will further facilitate the joint water-quality implementation efforts in the Missisquoi Bay. A reciprocal agreement to hold tours of cooperative conservation efforts has been established that will involve farmers and conservation officials on both sides of the border.

Ann Dudas,
public affairs specialist, SCS, Winooski, Vt.

public concern over eutrophication of the lakes prompted one of the first studies of nonpoint-source water pollution. This study which concentrated on the pollution loads coming from land use activities in the basin identified phosphorus as the principal pollutant and resulted in the signing of the first Great Lakes Water Quality Agreement in 1972. Norm Berg, then chief of SCS, cochaired this activity for the United States.

Another pioneering effort in the Great Lakes was the U.S. Army Corps of Engineers' Lake Erie Wastewater Management Study, which addressed nonpoint-source pollutants from agricultural lands. Findings of this study led to changes in the Great Lakes Water Quality Agreement in 1978 and again in 1983 to specifically address phosphorus reduction goals.

In 1985, several State governments in the United States and provincial governments in Canada agreed to cooperate in managing the Great Lakes. This initiative was in response to a plan to divert water to watershort areas of the United States. In 1985, the Governors of the Great Lakes States signed the Great Lakes Toxic Substances Control Agreement, which seeks to reduce pollution of the Great Lakes as much as possible and to keep environmental and public health priorities ahead of economic priorities.

The story doesn't stop here. Just this past year, the governments of Canada and the United States concluded a series of meetings to update the water quality agreements and to ensure that the control of persistent toxic substances will be addressed as we continue our vigil to preserve this natural resource.

While agricultural interests have been involved over the years, it was not until 1981 that agricultural members were appointed to the commission's Water Quality Board. Peter Myers, then head of SCS and now deputy secretary of the USDA, was appointed as the first U.S. member representing agricultural interests, and he still holds this position. Homer Hilner, SCS State conservationist for Michigan serves on the board's program committee and coordinates the Great Lakes activities of SCS staffs in the eight Great Lakes States.

Meeting the phosphorus management goals has been linked to the control of nonpoint-source pollution from agricultural lands. To this end, the Water Quality Board has established a nonpoint-source subcommittee on which the agricultural interests of U.S. farmers are represented by George Stem, an SCS national program manager.

For 79 years, the International Joint Commission has never waivered in its commitment to protect the Great Lakes as a valuable resource and has made it possible for a bilateral effort to reduce the pollution entering the lakes. SCS is becoming increasingly involved in the effort.

Walter Rittall,
assistant director, Land Treatment Program Division, SCS, Washington, D.C.

Venezuela Looks at U.S. Conservation

Helping Latin American countries expand their agriculture has been a long-time effort of the U.S. Department of Agriculture (USDA). But sometimes natural resource management is not a high priority for an expanding country. This was true for Venezuela.

Venezuela is one of the United States' most important Latin American trading partners. In 1982, the two countries formed a joint Commission on Agriculture for the exchange of agricultural information. The commission has exchanged information about cattle health; soil, water, and forestry management; fertilizer use; research, education, and training; private sector involvement in agriculture; and agricultural marketing.

"Initially, natural resource conservation was not a priority of the commission," said Richard Rortvedt, executive secretary for the commission with USDA's Office of International Cooperation and Development. "However, as we have worked with the Venezuelans in this agricultural exchange, they have now established it as an ongoing priority."

Each year, at the request of the commission, teams of specialists from American universities and USDA have visited Venezuela. Among other things, the teams have looked at drainage practices, sediment and erosion problems where agriculture is being developed, and water management practices.

"Recommendations are developed jointly by the U.S. people and the Venezuelan government officials," said Rortvedt. "Since the recommendations are jointly developed and presented to each country's secretary of agriculture, many of them have already been put into action."

"One of the recommendations," said Ron Hendricks, State conservationist in Nebraska for USDA's Soil Conservation Service and a U.S. team member, "was to stimulate local participation in conservation similar to our natural resource or conservation districts." Toward this end, a group of Venezuelans has already visited some conservation districts in the United States.

Other natural resource recommendations of the commission have included:

—to reduce severe erosion problems, the Venezuelans could develop a program by observing foreign approaches to watershed development.

—to start resource management planning on farms and ranches, individuals could be trained to provide this service. This training has already begun.

—to make the best use of resource data, the data should be interpreted and distributed for use by government workers, researchers, and land users.

The commission is scheduled to continue through 1989.

Patrick McGrane,
public affairs specialist, SCS, Lincoln, Nebr.

To Denmark And Back

"Shelterbelt plantings were evident throughout the country, increasing in density from east to west," said Barb Bush. "The newer shelterbelts, less than 15 years old, have strictly deciduous species and are used primarily as field windbreaks."

Bush wasn't talking about Nebraska, where she works in Mullen as a district conservationist for the Soil Conservation Service. She was talking about Denmark, a country she recently visited to exchange information on soil and water conservation.

Bush was one of four Americans who spent 4 weeks in Denmark this past September in a program sponsored by Communicating for Agriculture, based in Fergus Falls, Minn.; Agricultural Communication Worldwide; Danish Agricultural Council; and Hedselskabet (Danish Land Development Service). In addition to Bush, the group included Mark Kunz, SCS district conservationist from Wabash, Minn.; Perry Wilkerson, SCS district conservationist from Waycross, Ga.; and Sue Wika, a recent agricultural journalism graduate from South Dakota State University.

Each participant lived and worked with a Danish farm family during harvest time. Consultants for Hedselskabet served as guides in their day-to-day activities of helping farmers with shelterbelt plans, tree plantings, and other erosion and water quality activities.

"I was impressed with the efficient and professional manner of the Hedselskabet consultants in working with the landusers," said Wika.

"Danes place a high priority on maintaining optimal ground and surface water quality," said Kunz, who noted that the Danish Government has enacted laws restricting certain chemical applications to the soil. "Farmers are required to have adequate waste storage facilities, follow strict laws that limit time of application to fields, and must plow the application under within 12 hours."

Wilkerson said he was impressed by the Danish farmers' crop rotations and use of animal waste as fertilizer. "They practice a more diverse agriculture than we do," he said, "and are less likely to devote their operations to just one crop. At the same time, their use of conservation tillage and no-till seems to be only in the early stages."

In addition to sharing conservation information, the exchange was also to provide the participants with valuable work experience and a better understanding of Denmark's culture. Said Bush, "We were all impressed with the hospitality and personal interest of our hosts, from the Hedselskabet consultant hosts to the farm families, who were busy harvesting while we were there."

Patrick McGrane,
public affairs specialist, SCS, Lincoln, Nebr.

SCS Assists the Dominican Republic

In 1981, the Dominican Republic, where Spanish is the national language, asked the Soil Conservation Service of the U.S. Department of Agriculture for assistance in developing a natural resources management program. SCS responded with a team of professionals who could plan and organize the type of assistance needed—and speak Spanish.

The SCS team came to the Dominican Republic from neighboring Puerto Rico, where SCS has 40 years of experience in addressing natural resource problems under similar climatic and physiographic conditions. Under an agreement with the U.S. Agency for International Development (AID), SCS provided technical assistance in soil conservation and watershed management in watersheds identified as having serious erosion problems.

Each year since 1981, the SCS staff has provided training to Dominican technical and professional staff and direct field assistance to Dominican farmers. Training has been in soils, conservation planning, technical guides, engineering, and operations management.

Training in soils has included courses on mapping and classifying tropical soils, followed by field training with SCS specialists working in the Dominican Republic and Dominicans coming to Puerto Rico. In recent years, assistance has moved into soil interpretations.

SCS professionals have conducted short courses on conservation planning for watersheds, translated a conservation planning manual for use by the Dominicans, and gone into the field to work directly with project personnel and farmers.

Most of the Dominican staff have come to Puerto Rico to work in the field with SCS conservationists for 2 to 4 weeks at some point during the 7-year exchange program. In addition, SCS has provided Spanish translations of standards and specifications for the most commonly used conservation practices as well as training in the use of the Universal Soil Loss Equation. This year SCS will be helping the Dominicans to provide assistance using a technical guide similar to SCS Field Office Technical Guides.

Engineering assistance has included onsite visits by SCS engineers to large problem areas, designs for remedial actions, and instructions on practice and structure installations, such as gabions to control severe gully erosion.

Last year an SCS team reviewed and gave suggestions on a proposed comprehensive watershed management plan. The SCS team provided assistance in management, administration, and technical soil and water conservation issues.

AID funding for this effort expires in July 1988, but the Dominican Government now has a good foundation on which to build a national natural resource management program. Much of the success of this effort is directly related to the technical assistance provided—in Spanish—by SCS.

Jeffrey Vonk,
director, Caribbean Area, SCS, Hato Rey, Puerto Rico

Improving Farms in Mexico

The ejido farmers in southern Mexico work together on cummunal farms. And with assistance from PRODERITH, even their development efforts are becoming well coordinated.

PRODERITH is the Mexican Government's Program for Integrated Rural Development of the Humid Tropics. It is funded by a loan from the World Bank. Its goal is to bring all components of development for an area—such as roads, drains, health services, education, increased crop production, and soil and water conservation—into one coordinated plan.

The ejido farmers are communal farmers. They have the right to farm the land but do not own it. Nevertheless, with technical assistance from the Soil Conservation Service of the U.S. Department of Agriculture (USDA), these farmers are making important strides in protecting the soil and water resources.

SCS has provided technical assistance to PRODERITH since 1981 through USDA's Office of International Cooperation and Development (OICD). SCS specialists on long-term assignments help PRODERITH develop long-range goals and work with the farmers in planning and implementing needed conservation.

In September 1987, technical staff from OICD and SCS in Washington, D.C., reviewed progress in a pilot area near Mante, Mexico. Manuel Contijoch, PRODERITH coordinator, showed the group where conservation planning was in progress and conservation practices were being installed.

A livestock ejido visited was reported ahead of its loan repayment schedule, and the farmers gave credit for their success to SCS technical assistance in grazing management. This assistance included estimating total forage production based on production sites within the grazing unit.

The group also visited a cropland ejido farm that had waterways, contour farming, terraces, and rock drop structures. Outlets for runoff were being built and grassed.

In another area, farmers who had cleared the land using only machetes proudly displayed a tractor and bush hog they had just received.

Other agricultural successes in the six pilot areas of PRODERITH include an increase in crop area by about 40,000 hectares; an increase in maize yields of about 60 percent (compared to an increase of about 20 percent outside the pilot areas); and the formation of about 50 small poultry, sheep, bakery, and other farm-related enterprises.

To build on the experience gained from PRODERITH I, PRODERITH II is currently underway. Soil conservation programs are part of PRODERITH II, and—as with PRODERITH I—SCS will provide technical assistance.

Foy Hendrix,
assistant director, International Conservation Division, SCS, Washington, D.C.

David Schertz,
national conservation agronomist, SCS, Washington, D.C.

Moving?

Send present mailing label and
new address including zip code to:

U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 2890, Room 6202–S
Washington, D.C. 20013–2890

Official Business
Penalty for private use, $300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA-SCS
WASHINGTON DC
PERMIT NO. G-267

AgEvents 1988

March	20–26	National Wildlife Week
	20	National Agriculture Day
April	1–30	Keep America Beautiful Month
	17–23	National Volunteer Week
	22	National Arbor Day
	24–May 1	Soil and Water Stewardship Week
May	5–6	International Land, Pasture, and Range Judging Contest
June	5	World Environment Day
September	10	Public Lands Day
	18–24	National Farm Safety Week
	24	National Hunting and Fishing Day
October	16	World Food Day
	2–8	National 4–H Week
November	18–24	National Farm City Week

New Publications

Plants: Improving Our Environment

The Soil and Water Conservation Society (SWCS) has issued an informational cartoon booklet, *Plants: Improving Our Environment*, the latest in their series on conservation education.

The booklet and teacher's guide examine the important role that plants play in our environment.

Children reading the booklet will discover many different uses of plants, such as pollution abatement, soil conservation, beautification, building materials, fuel, medicine, flavoring, and more.

In the story, skateboard enthusiasts Sylvia and George are granted three wishes by a genie and visit an urban forester, a farmer, and a naturalist.

The teacher's guide, in file-folder format, includes background information; four activity masters; and 19 math, language arts, social studies, and science activities that reinforce and build on the educational concepts and help the teacher evaluate students' progress.

The booklets are targeted to the upper elementary grades. Single copies of this booklet are available for 75 cents, and single copies of the teacher's guide are $2, from SWCS, 7515 N.E. Ankeny Road, Ankeny, IA 50021. Substantial discounts are available on quantity purchases of both the booklet and teacher's guide.

Groundwater Protection

by the Conservation Foundation

Half of our Nation's population depends on groundwater for drinking. As contamination of groundwater supplies is found in almost every State, concern is mounting. *Groundwater Protection* is a response to this problem. The volume is a joint effort by the National Groundwater Forum and its sponsor, the Conservation Foundation.

Part I is the final report of the National Groundwater Forum, held in 1985. The goal of the forum was to formulate a "persuasive national program for groundwater management and protection, assigning responsibilities among all levels of government and the private sector." The forum's final report calls for an "aggressive" national policy to assure groundwater protection for the use of future generations. It also recommends a 10-point groundwater protection plan for State governments. Finally, included are revised conclusions to their report, recommendations, and a summary of the comments received at the hearings as well as in writing.

Part II is an overview of the groundwater pollution problem in the United States, prepared by the staff of The Conservation Foundation and is meant to serve as reference material for those who are concerned with the issues discussed in the forum's report.

This book is available for $15 from Publication Department AAA, The Conservation Foundation, 1255 Twenty-Third Street, N.W., Washington, DC 20037.

U.S. GOVERNMENT PRINTING OFFICE: 1988—201–107/60010